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THE AEDES OF THE MOUNTAINS OF CALIFORNIA AND OREGON

(Diptera, Culicidæ)

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During the summer of 1920 further observations were made on the peculiar mosquito fauna of the Californian mountains. I have referred to this fauna twice previously (Ins. Ins. Mens., iv, 80–90, 1916; v, 11–21, 1917), but the males of a number of the species remained unknown. These have now been obtained.

The central part of the fauna lies in the Lake Tahoe region. Northward of this two of the species (*cataphylla* and *fisheri*), and possibly a third (*ventrovittis*), drop out; but the fauna extends northward at least as far as the mountainous area about Crater Lake in Oregon.

Aëdes (Heteronycha) tahoënsis Dyar.

This is allied to *lazarensis* Felt & Young, my comparison with *pullatus* Coquillett (Ins. Ins. Mens., v, 11, 1917) being in error, due to a misapprehension of *pullatus* at the time. The coloration of the mesonotum is gray, mixed with brown or yellow-brown, the blackish lines usually distinct, frequently with gray spots on each side. The form should possibly be classified as a race of *lazarensis, Aëdes lazarensis tahoënsis* Dyar. The coloration is as in the western form of *lazarensis*, which occurs as an occasional variety in the Rocky Mountain region. In *tahoënsis* the normal coloration of *lazarensis* is not seen. In the Alaskan race, *borealis* Ludlow, there is extreme variation, occasionally matching the *tahoënsis* coloration, but

rather as an accident. In the male hypopygium, the spine at the basal lobe of the side piece is slightly more outwardly placed than in *lazarensis,* but the character does not appear equally distinct in all mounts, and is too indefinite for a positive separation. The other male characters are alike. In the larva the upper pair of head hairs show a tendency to be multiple, but subject to the usual variation. I do not consider the character to be necessarily specific, though indicating a racial distinction.

In the high land about Lake Tahoe, where the large open snow-pools occur, the *tahoënsis* adults are large and distinctly marked. Farther to the north, conditions being less favorable, the adults are small, and the dorsal markings more or less confused. The appearance reminds one of *impiger* (*decticus*), but the male hypopygium remains normal. In the high land about Mount Elwell (Feather River region), the species was abundant, but only a few large specimens were seen. At Crater Lake they were small with confused markings, and not abundant, being largely replaced by *masamae,* discussed later. The species thus has its main center about Lake Tahoe, and degenerates northward.

Additional data are as follows: Summit, Placer County, California, June 12–20, 1920 (H. G. Dyar); Tahoe City, California, June 16, 17, 18, 1920 (H. G. Dyar); Gold Lake, Sierra County, California, June 26, 1920 (H. G. Dyar); Camp Elwell, Plumas County, California, June 23–27, 1920 (H. G. Dyar); Crater Lake, Oregon, July 28–30, 1920 (H. G. Dyar).

Males were observed swarming at Camp Elwell, the habits being the same as with *hexodontus,* described later.

Aëdes (Heteronycha) masamae, new species or variety.

Female. Large; mesonotum with dark bronzy brown scales over the anterior portion, the scales about the antescutellar space and the roots of the wings whitish; two blackish stripes, broad in front, narrow and a little curved behind; short side stripes similar, moderate, bent on the lateral suture. Head dark, with small patch of whitish scales on the vertex and larger one on each side. Abdomen black scaled, with narrow

basal segmental white bands, widening on the sides; venter mostly whitish scaled. Legs black, the femora white at base and beneath to tip; tibiæ and first tarsal joint below with many white scales. Wing scales black, those on subcostal, second and fourth veins appearing paler.

Type, female, No. 23832, U. S. Nat. Mus.; Crater Lake, Oregon, July 29, 1920 (H. G. Dyar).

Variation consists in the light scales creeping forward from the ante-scutellar space between the dark stripes, replacing the brown ground. When the light scales surround the disk of mesonotum, the marking of *tahoënsis* appears. It may be that this is a variety of *tahoënsis,* but the normal small form occurs with it, though sparingly. This is the commonest mosquito at Crater Lake. Occasionally the blackish mesonotal stripes are weak or possibly absent. No males were obtained, so the exact standing of the form must await further explorations; but it seems best to call attention to it by description.

I have heretofore referred to *altiusculus* Dyar from Mount Rainier, Washington, as a diminutive form of *tahoënsis.* The mesonotum of *altiusculus* is dark yellow with distinct blackish markings. It is difficult to see how it can be a form of *tahoënsis,* as the evolution of the markings northward follows a different course; but *altiusculus* might be a form of *masamae.*

I have a small series of females from Kaslo, British Columbia, with almost the same markings as *masamae;* but these, as shown by the larvæ, are *punctor,* form *centrotus,* and probably have nothing to do with the present form, which I take to be an ally or variety of *tahoënsis.*

One hundred and eighty-seven females are before me, Crater Lake, Oregon, 8,000 feet, July 28–30, 1920 (H. G. Dyar). Though taken at 8,000 feet, it is evident from the contour of the land that the breeding grounds are from 1,000 to 2,000 feet lower.

Aëdes (Heteronycha) cataphylla Dyar.

This species is very close to *prodotes* Dyar, as previously remarked by me (Ins. Ins. Mens., vii, 22, 1919; viii, 23, 1920).

In fact, I think the two are identical, in spite of the geographic discontinuity. The discontinuity seems certain, for I did not take the species in the Feather River region either in 1916 or 1920, nor at Crater Lake in 1920, although it was conspicuous in the Lake Tahoe region. I think the colony in the high Sierras is isolated; but as I cannot demonstrate any differences in coloration, male hypopygium, or larva, I do not think that the form can be separated. The name *cataphylla* is older and will take precedence over *prodotes*.

The larva has four separated and detached teeth on the air-tube beyond the pecten-tuft on one side and two on the other, or three on each side. These detached teeth are evidently somewhat variable in number, but the terminal one is near the end of the tube as in my description of *prodotes* (Ins. Ins. Mens., viii, 10, 1920).

The males swarm over open spaces high up, as I observed for *prodotes* (Ins. Ins. Mens., viii, 10, 1920). At Tahoe Tavern a single male was seen over a path in the woods about 6 p. m. about 10 feet in the air. The sun had not set, but the approaching cool of evening was apparent. Males were also found flying in shaded woods as late as 8.30 a. m., before the sun had penetrated the shadows.

Additional data are as follows: Summit, Placer County, California, issued from pupa, June 17 and 20, 1920 (H. G. Dyar); Tahoe City, California, June 11–20, 1920 (H. G. Dyar).

Aëdes (Heteronycha) hexodontus Dyar.

I have given (Ins. Ins. Mens., viii, 26, 1920) reasons for considering this as a distinct species, and not a race of *punctor* Kirby, to which it is closely allied. The mesonotum is yellow or brown, with the blackish bands variable, often absent, but never assuming the single broad median band characteristic of *punctor*. The larvæ occur in very shallow marshy pools, never in the deep open pools favored by *tahoënsis*. The swarming of the males is peculiar. The flight occurs just preceding sunset, for half an hour or more, but ceases as soon as the sun has actually set. The swarms are low down, a foot or

two from the ground, before bushes or the lower part of trees, on the shaded side, but while the sunlight is still streaming through. On two occasions at Camp Elwell the swarming was noted, especially in one case, where the swarm was actually in camp, over a little path cut through low pines. A second flight occurs also early in the morning, continuing in the cool parts of the woods as late as 8.30 a. m.

Additional data are as follows: Tahoe City, California, June 11–20, 1920 (H. G. Dyar); Summit, Placer County, California, June 19–27, 1920 (H. G. Dyar); Gold Lake, Sierra County, California, June 24, 1920 (H. G. Dyar); Lakes Center Camp, Plumas County, California, June 22–29, 1920 (H. G. Dyar); Camp Elwell, Plumas County, California, June 23–July 15, 1920 (H. G. Dyar); Crater Lake, Oregon, July 28–30, 1920 (H. G. Dyar).

Aëdes (Heteronycha) fisheri Dyar.

I stated the opinion (Ins. Ins. Mens., viii, 23, 1920) that *fisheri* represented *intrudens* of the Canadian fauna. The discovery of the male shows that the resemblance is superficial, and that *fisheri* is really a distinct species of the *punctor* group. The original locality of *fisheri* being given as "Lake Tahoe," I spent some time searching various places at the 6,000 foot level, which is the level of the lake, but without success. There is no place called "Lake Tahoe," the lake itself being 70 miles in circumference. Later it appeared that *fisheri* does not occur at this level, but 1,000 feet higher, at the 7,000 foot level, as at Summit, Placer County. It is apparent, therefore, that the labels attached by Dr. Fisher were of a general nature only, and that he actually obtained the specimens which became types at a higher level, not improbably in Desolation Valley above Fallen Leaf Lake. Dr. Fisher told me that he took the specimens at Tahoe Tavern (Ins. Ins. Mens., v, 19, 1917); but I feel sure that his memory was at fault in this instance. It is certain that my own collections failed to disclose the species in this locality.

Male. Palpi only slightly exceeding the proboscis, black, with long black hairs on the last two joints. Mesonotum

black, without scales, but with dense black hairs, those posteriorly as well as on the fore coxæ long. Abdomen entirely black above and below, densely hairy. Legs black, bronzy brown below. Wing scales black.

Hypopygium. Side pieces three times as long as wide, conical at tips. Apical lobe elliptical, not strongly elevated, clothed with stout recurved clinging hairs. Basal lobe tubercularly expanded, clothed with short strong curved setæ, becoming longer at the inner angle, where in a dense tuft is a single slender spine with curved tip. Claspette slender, moderate, the filament short, thick, curved and sickle-shaped. Ninth tergites moderate, with three long and two shorter spines at tip.

Female. Head and mesonotum normally scaled, without long hairs, which are absent also on the front coxæ. The vestiture of the mesonotum is coarse, and uniformly dark bronzy brown.

Larva. Head dark brown, the hairs single; ante-antennal tuft in six. Lateral comb of the eighth segment of about seven scales in an irregular row, each scale smooth and with long central spine. Air-tube about three times as long as wide or less, conical; pecten of about nine teeth, followed by one or two widely detached ones and a hair-tuft. Anal segment with broad dorsal saddle distinctly separated on ventral line, although nearly touching; tufts preceding the ventral brush running half way to base. Anal gills long, four.

The larvæ frequent flat shallow pools, occurring in one case in a small drainage pool about 2 feet in diameter in a grassy meadow, and again in shallow pools in grass, being very large pools formed by the high water of a small lake. In both cases *hexodontus* larvæ occurred with them, and in the second instance *palustris* larvæ also.

Additional data are as follows: Summit, Placer County, California, issued from pupæ, June 18, 19, 21, 22, 1920 (H. G. Dyar).

Aëdes (Heteronycha) increpitus Dyar.

Additional data are as follows: Tahoe City, California, June 12-20, 1920 (H. G. Dyar).

The males were observed swarming on a hillside overlooking the lake, in forest, about the edges of *Ceanothus* bushes. The flight occurred just after sunset, when it was just becoming difficult to see clearly in the shade of the bushes, although the sun was still shining on distant hilltops. This represents about the normal time of swarming, and not unusually early, as with the other Californian species.

Aëdes (Heteronycha) palustris Dyar.

I have shown that this may be considered as a race of *fitchii* Felt and Young (Ins. Ins. Mens., viii, 117, 1920), *Aëdes fitchii palustris* Dyar.

Additional data are as follows: Tahoe City, California, June 14, 17, 1920 (H. G. Dyar); Truckee, California, June 21, 1920 (H. G. Dyar); Summit, Placer County, California, June 10, 24, 29, 1920 (H. G. Dyar); Lakes Center Camp, Plumas County, California, July 1, 3, 1920 (H. G. Dyar); Camp Elwell, Plumas County, California, June 24, 27, 1920 (H. G. Dyar); Crater Lake, Oregon, July 28–30, 1920 (H. G. Dyar).

The Crater Lake specimens are all females, some large; but as they all have many white scales on the wings and much gray on the sides of the mesonotum, I have classed them as *palustris*. The Crater Lake fauna has peculiarities of its own, as remarked above under *masamae,* and further investigation of the *palustris* would undoubtedly prove of interest.

Aëdes (Taeniorhynchus) varipalpus Coquillett.

Additional data are as follows: Dunsmuir California, August 1, 1920 (H. G. Dyar); Hoodsport, Washington, July 6, 7, 1920 (H. G. Dyar); Lake Cushman, Washington, July 3, 4, 1920 (H. G. Dyar); Okanogan, Washington, July 19, 1920 (H. G. Dyar); Mission City, British Columbia, July 14, 1920 (H. G. Dyar).

Aëdes (Ecculex) vexans Meigen.

No additional specimens of this species were taken in the mountains proper. It appertains to the lower levels, being one of the commonest flood-pool species of river valleys.

Aëdes (Aëdes) cinereus Meigen.

Additional data are as follows: Lakes Center Camp, Plumas County, California, issued from pupæ, June 30 and July 1, 1920 (H. G. Dyar).

These larvæ, the only ones found, occurred in some ditch-pools which dried out the following day, several days before pupation, so that if these larvæ had not been collected, they would all have perished. The altitude is 6,200 feet; previous records being Fallen Leaf Lake, 6,100 feet, and Yosemite Valley, 4,000 feet.

The larvæ were associated with *hexodontus,* the latter being in the pupa stage, and probably emerged in part before the pools went dry.

Aëdes (Aëdes) ventrovittis Dyar.

The discovery of the male gives the unexpected result that this is an ally of *Aëdes cinereus* Meigen.

Male. Palpi short, about one-eighth as long as the proboscis, black; antennæ plumose, black, the rings white on the narrowed part, the last two joints long and slender. Mesonotum with bronzy brown scales and two rather broad bands of black ones running back to near the antescutellar space; posterior side stripes indistinct and narrow. Abdomen black above, with basal, lateral, small, segmental, triangular whitish patches; venter with dull whitish scales, the apices of the segments and mid-ventral line black. Wing scales all black. Legs black scaled, the femora white beneath, their tips narrowly white.

Hypopygium. Side pieces about two and a half times as long as broad, tapering sharply at the tip. Clasper subapical, furcate at the tip, the outer arm the longer, finely tubercular, but without spine; an elliptical process at the base, bearing setæ on outer margin. From the base of the side-piece membrane arise two lobes, divaricate, each with three setæ. Basal angle of side-piece with a large patch of hairs and a small lobe. Tenth sternites narrow, normal. Aedoeagus expanding outwardly, curved, dentate at tip, all exactly as in *cinereus* Meigen.